

WE CLAIM:

1. A method comprising:

responsive to a prompt having a specified time,  
looking up on the basis of the specified time at least one  
5 event information to report at the specified time using at  
least one memory, each event information being associated with  
an associated processing engine of at least one processing  
engine; and

for each event information to report at the specified  
10 time, forwarding at least some of the event information to the  
associated processing engine.

2. A method according to claim 1 wherein the prompt  
comprises a time index for the specified time and wherein the  
looking up on the basis of the specified time at least one  
15 event information to report at the specified time using at  
least one memory comprises looking up a memory of the at least  
one memory using the time index.

3. A method according to claim 2 wherein the at least  
one processing engine comprises a plurality processing engines.

20 4. A method according to claim 3 wherein each of the  
plurality of processing engines is assigned at least one port  
of a plurality of ports, each port of the plurality of ports  
having a respective port identifier and each port having  
assigned to the port at least one of the plurality of  
25 processing engines, wherein the looking up a memory of the at  
least one memory using the time index comprises for each port  
of the plurality of ports:

looking up the memory of the at least one memory  
using the time index and the respective port identifier of the  
30 port.

5. A method according to claim 1 further comprising prompting, at periodic intervals, for the looking up on the basis of the specified time at least one event information to report at the specified time using at least one memory, the  
5 specified time being incremented at each of the periodic intervals.

6. A method according to claim 5 wherein the prompting, at periodic intervals, comprises for each of the periodic intervals prompting with a respective time index for the  
10 specified time and storing the respective time index in queue in a FIFO (First In, First Out) buffer.

7. A method according to claim 1 wherein the looking up on the basis of the specified time at least one event information to report at the specified time using at least one  
15 memory comprises looking up a combination of a CAM (Content Accessible Memory) and a RAM (Random Accessible Memory).

8. A method according to claim 4 wherein for each port of the plurality of ports the looking up the memory of the at least one memory using the time index and the respective port  
20 identifier of the port comprises:

looking up a CAM (Content Accessible Memory) using the time index and the respective port identifier of the port to obtain at least one address; and

for each address of the at least one address, looking  
25 up a RAM (Random Accessible Memory) using the address to obtain an event information of the at least one event information to report at the specified time.

9. A method according to claim 1 wherein for at least one of the at least one event information to report at the  
30 specified time, the at least some of the event information

comprises information identifying a data frame to be processed by the associated processing engine.

10. A method according to claim 1 wherein for each event information to report at the specified time, the event

5 information comprises information indicating whether a memory of the at least one memory needs to be reloaded for a next event and information identifying a time for the next event, the method comprising for each event information to report at the specified time:

10 if the information for identifying whether the memory of the at least one memory needs to be reloaded indicates that reloading is required, updating the memory of the at least one memory for reporting the next event at the time for the next event.

15 11. A method according to claim 1 wherein for each event information to report at the specified time, the method comprising storing the at least some of the event information in queue in a FIFO (First In, First Out) buffer for the forwarding at least some of the event information to the  
20 associated processing engine.

12. A method according to claim 1 comprising:

prior to the prompt, for each event information to report providing instructions for updating a memory of the at least one memory with the event information.

25 13. A method according to claim 12 wherein for each event information to report, the providing instructions comprises:

determining a time for processing by the associated processing engine, the time for processing by the associated processing engine corresponding to the specified time.

14. A method according to claim 13 wherein the determining a time for processing by the associated processing engine comprises:

determining a window in time for receiving data frames that are to be used to obtain a combined data frame in DHO (Diversity Hand-Off); and

from the window in time, determining a time for processing the data frames that are to be used to obtain the combined data frame in DHO.

15. A method according to claim 14 wherein the window in time has a center that depends on an offset time,  $t_{\text{offset}}$ , for shifting in time the center of the window and wherein the data frames that are to be used to obtain the combined data frame in DHO have respective times of arrival, the determining a window in time comprising:

calculating a running average,  $t_{\text{run}}$ , of a difference in time between the center of the window in time and the respective times of arrival of the data frames that are to be used to obtain the combined data frame; and

if the running average,  $t_{\text{run}}$ , exceeds a time,  $t_{\text{max}}$ , modifying the offset time,  $t_{\text{offset}}$ , for shifting in time the center of another window in time to be determined.

16. A method according to claim 8 wherein the at least one event information to report at the specified time comprises a plurality of event information to report at the specified time and wherein each port of the plurality of ports has a respective FIFO (First In, First Out) buffer, the method comprising:

cycling through the plurality of ports, and for each port:

if the respective FIFO buffer of the port has storage available for storing a specified amount of event information, the looking up a CAM comprising performing a burst look up in the CAM to obtain a plurality of addresses, and for each  
5 address of the plurality of addresses looking up the RAM using the address to obtain an event information of the plurality of event information to report at the specified time and for each of the event information obtained storing at least some of the event information in queue in the respective FIFO buffer of the  
10 port,

wherein the cycling is repeated until all of the plurality of event information to report at the specified time have been stored in the respective FIFO buffers of the plurality of ports.

15 17. A method according to claim 8 wherein the at least one event information to report at the specified time comprises a plurality of event information to report at the specified time and wherein each port of the plurality of ports has a respective FIFO (First In, First Out) buffer, the method  
20 comprising:

for each port of the plurality of ports:

after the looking up a RAM using the address to obtain an event information, storing at least some of the event information in queue in the respective FIFO buffer of the port  
25 while performing another lookup in the CAM.

18. An apparatus comprising:

at least one memory adapted to store a plurality of event information, each event information being associated with an associated processing engine of at least one processing  
30 engine; and

a processor adapted to:

responsive to a prompt having a specified time, look up on the basis of the specified time at least one event information of the plurality of event information to  
 5 report at the specified time using the at least one memory; and

for each event information to report at the specified time, forwarding at least some of the event information to report to the associated processing engine.

19. An apparatus according to claim 18 wherein the  
 10 processor implements a state machine.

20. An apparatus according to claim 18 comprising a counter adapted to provide as the prompt a time index for the specified time and wherein the processor is adapted to look up a memory of the at least one memory using the time index to  
 15 look up the at least one event information to report at the specified time.

21. An apparatus according to claim 20 wherein the at least one processing engine comprises a plurality processing engines.

20 22. An apparatus according to claim 21 comprising a plurality of ports, each port of the plurality of ports having a respective port identifier and each port of the plurality of ports having assigned to the port at least one of the plurality of processing engines, each of the plurality of processing  
 25 engines being assigned at least one of the plurality of ports, the processor being adapted to for each port of the plurality of ports:

look up the memory of the at least one memory using the time index, and the respective port identifier of the port.

23. An apparatus according to claim 18 further comprising a clock adapted to prompt the processor at periodic intervals for the look up on the basis of the specified time at least one event information to report at the specified time using at  
5 least one memory, the specified time being incremented at each of the periodic intervals.

24. An apparatus according to claim 23 further comprising a counter adapted to receive the prompt from the clock and, at each of the periodic intervals, provide a respective time index  
10 to the processor.

25. An apparatus according to claim 24 comprising a FIFO (First In, First Out) buffer adapted to receive the respective time index from the counter and store the respective time index in queue for forwarding to the processor.

15 26. An apparatus according to claim 18 wherein the at least one memory comprises a CAM (Content Accessible Memory) and a RAM (Random Accessible Memory), the processor being adapted to look up the CAM using the specified time to obtain an address and adapted to look up the RAM using the address to  
20 obtain an event information of the at least one event information to report at the specified time.

27. An apparatus according to claim 22 wherein the at least one memory comprises a CAM (Content Accessible Memory) and a RAM (Random Accessible Memory) and wherein for each port  
25 of the plurality of ports, the processor being adapted to:

look up the CAM using the time index and the respective port identifier of the port to obtain at least one address; and

for each address of the at least one address, look up  
30 the RAM using the address to obtain an event information of the at least one event information to report at the specified time.

28. An apparatus according to claim 18 wherein for at least one of the at least one event information to report at the specified time, the at least some of the event information comprises information identifying a data frame to be processed  
5 by the associated processing engine.

29. An apparatus according to claim 18 wherein for each event information to report at the specified time, the event information to report comprises information indicating whether a memory of the at least one memory needs to be reloaded for a  
10 next event and information identifying a time for the next event, the processor being adapted to for each event information to report at the specified time:

if the information for identifying whether the memory of the at least one memory needs to be reloaded indicates that  
15 reloading is required, update the memory of the at least one memory for reporting the next event at the time for the next event.

30. An apparatus according to claim 18 comprising a FIFO (First In, First Out) buffer and wherein for each event  
20 information to report at the specified time the processor being adapted to store the at least some of the event information to report in queue in the FIFO buffer for forwarding the at least some of the event information to report to the associated processing engine.

25 31. An apparatus according to claim 18 comprising an interface adapted to:

prior to the prompt, for each event information to report provide instructions for updating a memory of the at least one memory with the event information.



32. An apparatus according to claim 31 wherein the interface comprises a processor, for each event information to report, the processor of the interface being adapted to:

determine a time for processing by the associated  
5 processing engine, the time for processing by the associated processing engine corresponding to the specified time.

33. An apparatus according to claim 32 wherein the processor is further adapted to:

determine a window in time for receiving data frames  
10 that are to be used to obtain a combined data frame in DHO (Diversity Hand-Off); and

from the window in time, determine a time for processing the data frames that are to be used to obtain the combined data frame in DHO.

15 34. An apparatus according to claim 33 wherein the window in time has a center that depends on an offset time,  $t_{\text{offset}}$ , for shifting in time the center of the window and wherein the data frames that are to be used to obtain the combined data frame in DHO have respective times of arrival, the apparatus comprising  
20 a memory for storing running average data and the processor of the interface being adapted to:

calculating a running average,  $t_{\text{run}}$ , of a difference in time between the center of the window in time and the respective times of arrival of the data frames that are to be  
25 used to obtain the combined data frame; and

if the running average,  $t_{\text{run}}$ , exceeds a time,  $t_{\text{max}}$ , modifying the offset time,  $t_{\text{offset}}$ , for shifting in time the center of another window in time to be determined.

35. An apparatus according to claim 27 wherein the at least one event information to report at the specified time comprises a plurality of event information to report at the specified time and wherein each port of the plurality of ports  
5 comprises a respective FIFO (First In, First Out) buffer, the processor being adapted to:

cycle through the plurality of ports, and for each port:

if the respective FIFO buffer of the port has storage  
10 available for storing a specified amount of event information, performing a burst look up in the CAM to obtain a plurality of addresses, and for each address of the plurality of addresses look up the RAM using the address of the plurality of addresses to obtain an event information of the plurality of event  
15 information to report at the specified time and for each of the event information obtained store at least some of the event information in queue in the respective FIFO buffer of the port,

wherein the processor is adapted to cycle through the plurality of ports until all of the plurality of event  
20 information to report at the specified time have been stored in the respective FIFO buffers of the plurality of ports.

36. An apparatus according to claim 27 wherein the at least one event information to report at the specified time comprises a plurality of event information to report at the specified time and wherein each port of the plurality of ports  
25 comprises a respective FIFO (First In, First Out) buffer, the processor being adapted to:

for each port of the plurality of ports:

after the looking up the RAM using the address to  
30 obtain an event information, store at least some of the event

information in queue in the respective FIFO buffer of the port while performing another lookup in the CAM.

37. A system comprising: /

at least one processing engine; and

5 a scheduler comprising:

at least one memory adapted to store a plurality of event information, each event information being associated with an associated processing engine of the at least one processing engine; and

10 a processor adapted to:

responsive to a prompt having a specified time, look up on the basis of the specified time at least one event information of the plurality of event information to report at the specified time using the at least one memory; and

15 for each event information to report at the specified time, forward at least some of the event information to report to the associated processing engine.

38. A system according to claim 37 wherein the processor implements a state machine.

20 39. A method of scheduling processing events comprising scheduling an event in respect of an event information by: /

storing the event information in a location in a RAM (random access memory), the location having an address;

25 determining a time at which the event is to take place; and

storing the address in a CAM (Content Addressable Memory) in a location associated with the time.

40. A method according to claim 39 wherein storing the address in a CAM in a location associated with the time comprises storing the address in the CAM in a location associated with the time and also associated with a port.

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41. A method according to claim 39 further comprising executing events scheduled at a specified time.

42. A method according to claim 41 wherein executing  
10 events scheduled at a specified time comprises:

looking up any addresses stored in the location in the CAM associated with the specified time;

reading an event information from each location in said RAM having one of said addresses;

15 executing a processing event associated with the event information.

43. A method according to claim 40 further comprising at a specified time and for each port:

20 looking up any addresses stored in the location in the CAM associated with the specified time and the port;

reading an event information from each location in said RAM having one of said addresses; and

forwarding the event information to the port.

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44. A method according to claim 42 wherein an event comprises running a particular processing engine using the event information.

30 45. A method according to claim 43 wherein each port has an associated at least one processing engine.